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(71) Applicant
Mercedes-Benz AG

(Incorporated in the Federal Republic of Germany)

Stuttgart-Unterturkheim, Federal Republic of Germany

(72) Inventors
Thomas Attinger
Wolfgang Kleineberg

(74) Agent and/or Address for Service
Jensen & Son
8 Fulwood Place, High Holborn, London, WC1V 6HG,
United Kingdom

(54) A radiator mounting for motor vehicles

(57) In a radiator mounting for motor vehicles, in which the radiator rests, by means of at least one support fixed to the radiator, against a respective corresponding support fixed to the vehicle, and in which the radiator is supported adjustably, via at least one further bearing (8) fixed to the radiator, on a corresponding bearing (19), fixed to the vehicle, which receives the radiator elastically, the bearing fixed to the radiator consists of a mounting pin 8 which can be inserted into an opening of the bearing (19) fixed to the vehicle and receives a mounting element (11) which bears with a contact surface (21) provided on it against a corresponding contact surface (22) of the bearing fixed to the vehicle. A pin (20) can hold the monitoring element (11) against the surface (22). Alternatively, a spring clip or a threaded spreader can be used instead of the monitoring element (11).

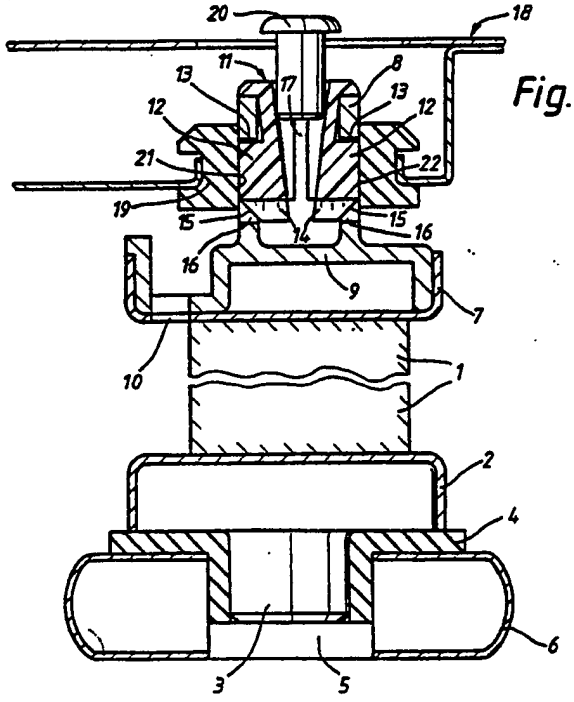

Fig. 1

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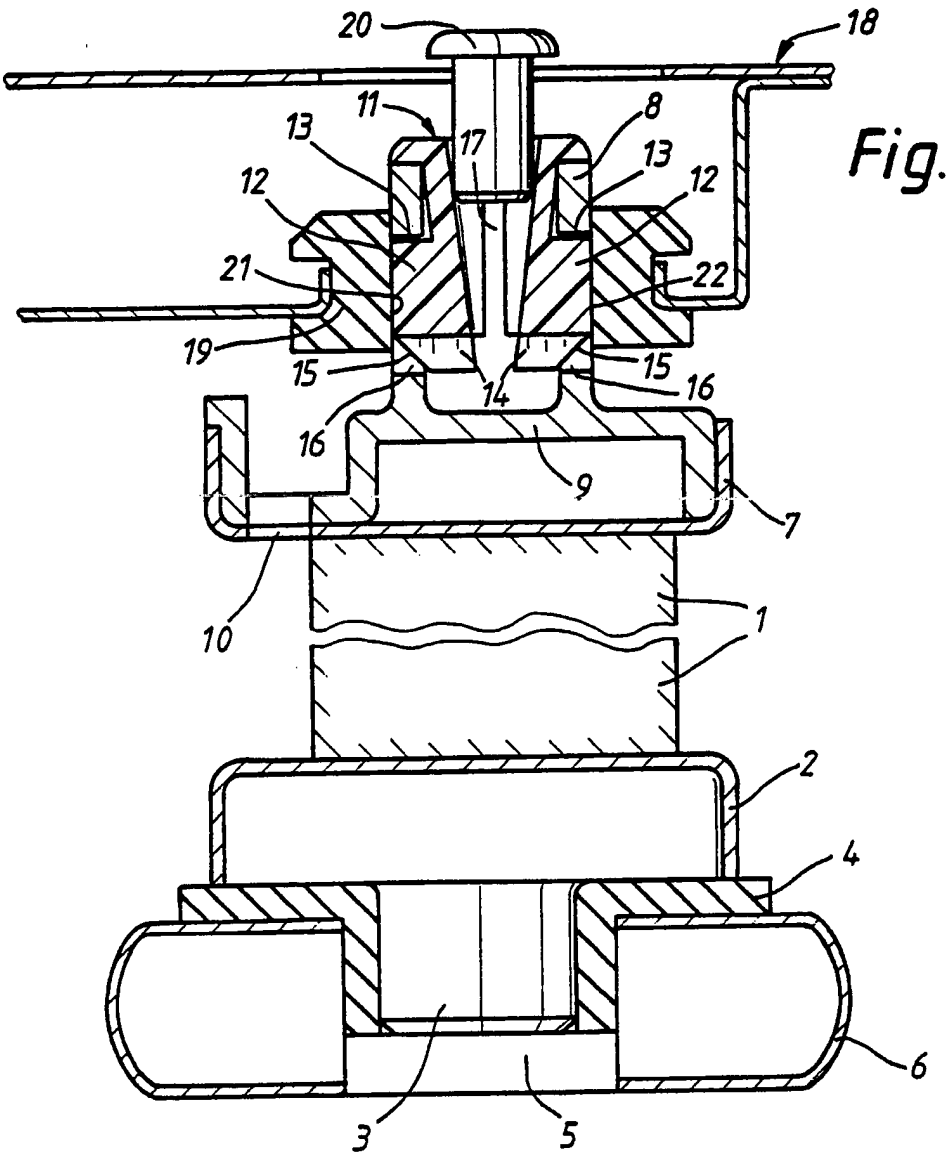
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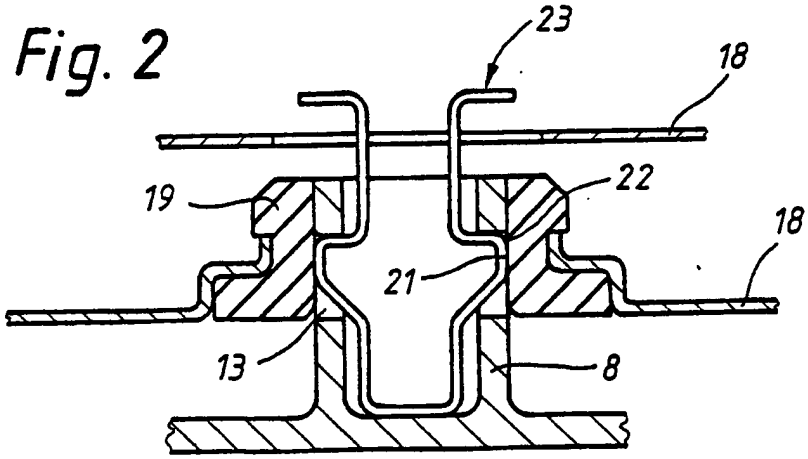
Fig. 1

Fig. 2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A Radiator mounting for motor vehicles

The invention relates to a radiator mounting for motor vehicles, in which the radiator is adapted to be supported, by means of at least one support fixed to the radiator, against a respective corresponding support fixed to the vehicle, and in which the radiator is supported adjustably, via at least one further bearing fixed to the radiator, on a corresponding bearing, fixed to the vehicle, which receives the radiator elastically.

A radiator mounting is known from EU 0,126,855 in which the radiator is received between elastic bearings supported on the mounting side, at least one of these bearings being adjustable by means of a screw and in this way bracing the radiator against the support fixed to the vehicle. The result is both that the radiator is held and that manufacturing and fitting tolerances of the mounting and radiator are compensated.

A disadvantage of this mounting consists in that with this type of mounting the radiator is stressed by the pressure exerted on it by the screw connection, and this leads to distortions in the radiator body.

The present invention seeks to create a radiator mounting in which the radiator can be fitted free from strain in a vehicle with compensation of possible tolerances.

According to the invention there is provided a radiator mounting for motor vehicles, in which the radiator is adapted to be supported, by means of at least one support fixed to the radiator, against a respective corresponding support fixed to the vehicle, and in which the radiator is supported adjustably, via at least one further bearing fixed to the radiator, on a corresponding bearing, fixed to the vehicle, which receives the radiator elastically, wherein the bearing fixed to the radiator

consists of a mounting pin insertable into an opening of the bearing fixed to the vehicle and which receives a mounting element, which mounting element has a contact surface which bears against a corresponding contact surface of the bearing fixed to the vehicle.

Preferably, the mounting element consists of an elastic spreader element, and at its lower end the spreader element may have a lead-in chamfer for insertion into the mounting pin. The spreader element may be braced by means of a tightening pin with its contact surface against the corresponding contact surface of the bearing fixed to the vehicle. The tightening pin may be provided with a thread and/or a set of teeth. Preferably, the spreader element comprises a spring clip, which may have a set of teeth on its contact surface.

Thus, a radiator for a motor vehicle rests, by means of at least one support fixed to the radiator, against a respective corresponding support fixed to the vehicle. On the upper side of the radiator, the radiator housing bears a hollow mounting pin, into which a likewise hollow spreader element is inserted which is provided with contact surfaces which come to be located in window-like openings of the mounting pin. In its fitted position, the mounting pin with the inserted spreader element is located in a rubber bush, inserted in the radiator bridge, with the aid of which it is held in the radial direction. There is introduced into the hollow, downwardly tapering spreader element a tightening pin which widens the internal diameter of the spreader element and in this way exerts a pressure on the contact surfaces which are thereby pressed against the corresponding contact surfaces of the rubber bush and in this way ensure a friction-locked connection between the radiator, on the one hand, and the radiator bridge fixed to the vehicle, on the other hand. The radiator is thereby retained in the axial direction, and manufacturing and fitting tolerances are compensated in the vertical

direction between the radiator and vehicle.

An illustrative embodiment of the invention is described below by way of example with reference to the drawing, wherein:

Figure 1 shows a radiator mounting according to the invention, in cross-section, and

Figure 2 shows a part of a second illustrative embodiment for a radiator mounting according to the invention, in cross-section.

Figure 1 shows in cross-section a radiator mounting of the type according to the invention having a radiator 1, which for the sake of simplicity is not represented in its entire length. At its lower end, the radiator 1 has a radiator receptor 2, into which a lower mounting pin 3 is inserted. With this mounting pin 3 the radiator 1 is inserted into a rubber bush 4, which in turn is arranged in a bore 5 of a lower radiator cross arm 6 fixed to the vehicle. The radiator 1 is supported in this way on the vehicle (not represented here).

The upper end of the radiator 1 consists of an upper radiator receptor 7, which receives a holder 9 provided with a hollow mounting pin 8. The radiator receptor 7 and holder 9 can contain, for example, a bore 10, into which a condenser of an air-conditioner can be inserted, if required. Inserted into the hollow mounting pin 8 is a likewise hollow spreader element 11, of which the internal diameter tapers towards its lower end and of which the pressure plates 12 snap into corresponding window-like openings 13 in the mounting pin 8. Insertion of the spreader element 11 into the mounting pin 8 is facilitated by the fact that at its lower end the spreader element 11 has ribs 14 on the side facing the window openings 13, which ribs are provided with a lead-in chamfer 15.

When the spreader element 11 is inserted into the mounting pin 8, these ribs 14 are pressed inwards by means of the lead-in chamfers 15 from the upper edge of the

mounting pin 8, the pressure plates 12 being brought into a position which allows the spreader element to be introduced into the hollow interior of the mounting pin 8. Not until the pressure plates 12 have entirely reached the window openings 13 can they once again spread outwards and fill up the window openings 13.

In this position, the ribs 14 are received in recesses 16 in the mounting pin 8. In order for the spreader element 11 to be able to experience the necessary change in shape during insertion, it has a slit-like incision 17 in the longitudinal direction. After the spreader element 11 is inserted into the mounting pin 8 - and the radiator 1 is held in its lower support 2, 3, 4, 6 - a radiator bridge 18, which can be screwed to the vehicle in a way not shown here and has an inserted rubber bush 19, which holds the radiator at its upper end, is placed over the mounting pin 8. The rubber bush 19 can be constructed such that its internal cross-section is larger in one direction than the external cross-sectional area of the mounting pin 8. In this way, it is possible for a tolerance compensation in the transverse direction of the radiator 1 to be made within specific limits.

A tightening pin 20 is inserted into the interior of the spreader element 11 to mount the radiator 1 on the radiator bridge 18. This can be done simply by pressing it in, but the tightening pin 20 can also be provided with a thread (not shown here) and screwed into the spreader element. When the tightening pin 20 is introduced into the spreader element 11, the internal diameter of the latter is widened, so that as a consequence the pressure plates 12 are also pressed outwards and bear with their external contact surfaces 21 against corresponding contact surfaces 22 of the rubber bush 19. Depending upon how far the tightening pin 20 is introduced into the spreader element 11, the contact pressure on these contact surfaces 21, 22 is increased, and the radiator is retained in its position.

It is consequently secured against movements in the vertical direction, and yet manufacturing and fitting tolerances can be compensated in the vertical direction owing to the fact that the mounting pin 8 can be pushed into the rubber bush 19 to different extents. If the tightening pin 20 is provided with a thread described above, it is consequently also simultaneously secured against slipping out of the spreader element 11. Such securing can also be achieved by providing the outer surface of the tightening pin 20 with a set of teeth which, in cooperation with the inner surface of the spreader element 11, prevent slipping out.

Since the introduction of the force by the spreader element 11 into the radiator bridge 18 is done at the same level, the contact force can be varied in a simple way by changing the extent of the tapering of the internal diameter in the spreader element 11, or of the external diameter of the tightening pin 20. It is possible through an oval construction of the mounting pin 8 and of the rubber bush 19 for the pressure plates 12 to be chosen with a large area, so that the compressive load per unit area between the pressure plates 12 and the rubber bush 19 can be kept low.

A second illustrative embodiment of the invention is shown in cross-section in Figure 2. In a partial representation showing the upper radiator mounting, a hollow mounting pin 8 with its window openings 13 is once again to be seen, into which a spreader element constructed as a spring clip 23 is inserted. The mounting pin 8 is inserted in a way already described into the rubber bush 19 of the radiator bridge 18, which can be screwed to the vehicle. The mode of operation of this radiator mounting is the same as in the illustrative embodiment described in Figure 1, but with the differ nce that the spread r element is constructed here as a spring clip 23, wh reby the fitting and dismantling is simplified.

In a way analogous to the previously described illustrative embodiment, it is also possible here for the contact surfaces 21 of the spring clip 23 to be provided with a set of teeth, which prevent a vertical displacement of the spring clip 23 on the corresponding contact surface 22. Common to the two illustrative embodiments is the fact that the radiator 1 is clamped only at the mounting pin 8, and that in this way no additional stress distorting the radiator 1 can arise.

Claims

1. A radiator mounting for motor vehicles, in which the radiator is adapted to be supported, by means of at least one support fixed to the radiator, against a respective corresponding support fixed to the vehicle,. and in which the radiator is supported adjustably, via at least one further bearing fixed to the radiator, on a corresponding bearing, fixed to the vehicle, which receives the radiator elastically, wherein the bearing fixed to the radiator consists of a mounting pin insertable into an opening of the bearing fixed to the vehicle and which receives a mounting element, which mounting element has a contact surface which bears against a corresponding contact surface of the bearing fixed to the vehicle.

2. A radiator mounting according to Claim 1, wherein the mounting element consists of an elastic spreader element.

3. A radiator mounting according to Claim 2, wherein at its lower end the spreader element has a lead-in chamfer for insertion into the mounting pin.

4. A radiator mounting according to Claim 2 or 3, wherein the spreader element is braced by means of a tightening pin with its contact surface against the corresponding contact surface of the bearing fixed to the vehicle.

5. A radiator mounting according to Claim 4, wherein the tightening pin is provided with a thread.

6. A radiator mounting according to Claim 5, wherein the tightening pin is provided with a set of te th.

7. A radiator mounting according to Claim 2, wherein the spreader element comprises a spring clip.

8. A radiator mounting according to Claim 6, wherein the spring clip has a set of teeth on its contact surface.

9. A radiator for motor vehicles, substantially as described herein, with reference to, and as illustrated in, the accompanying drawings.

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